PROGRAM PROPOSAL TO ASSIST IN THE POST-HURRICANE RECONSTRUCTION OF THE PUBLIC HEALTH CARE SYSTEMS OF CENTRAL AMERICA AND THE CARIBBEAN

Centers for Disease Control and Prevention (CDC), DHHS

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I. INTRODUCTION

In the months of September and October of 1998, 2 major hurricanes hit the Caribbean and Central America, resulting in extensive damage. Hurricane Georges swept first across the Caribbean and coastal United States in late September, causing tremendous damage and suffering as the result of the hurricane's winds and rainfall. For the Dominican Republic, the total damage to farms, roads and buildings was estimated to be in excess of $1.2 billion. A month later Hurricane Mitch struck Central America with even greater intensity, affecting Central America from Costa Rica to Guatemala; the impact was most severe in Honduras and Nicaragua. Over 18,000 people were reported killed or were never found, much of the public health infrastructure was damaged, and conditions favoring disease outbreaks arose. As predicted, post-hurricane outbreaks of cholera, leptospirosis and dengue have since been documented.

In response to this disaster, the Centers for Disease Control and Prevention (CDC) proposes carrying out a series of activities to assist in the reconstruction of the public health care systems and the implementation of programs to control health problems resulting from infectious diseases in those countries most severely affected by Hurricanes Georges and Mitch. CDC proposes a project to re-establish effective public health information systems and the capacity to respond to priority health problems including infectious disease outbreaks in the target countries through investments in both training and physical infrastructure. These inputs will be linked directly in each country to at least one specific health program selected by the MOH with activities in community based prevention and control.

Health information and surveillance systems are the fundamental elements of a public health system which provide reliable and timely information regarding the occurrence, nature and magnitude of major health problems which can threaten the health of the general population. They require active data reporting from health facilities, laboratory support for diagnostic confirmation and other analyses, trained epidemiologists for analysis of and response to the information, and health sector decision-makers who understand epidemiological principles to guide the policies they adopt. When successfully implemented, these systems are instrumental in assuring a comprehensive picture of the health status of the population and assist in the prevention and control of major public health threats, especially infectious diseases with epidemic potential.

The strategic objective for this initiative is "Re-establish and sustain the capacity for assessment of health status and the early detection and effective response to outbreaks and changes in disease patterns". To accomplish this objective CDC has developed four intermediate results (IR) packages which address the physical infrastructure, the training needs and the processes required for effective public health surveillance, program development and response capacity for infectious and non-infectious diseases.

IR 1. Disease surveillance rehabilitated and information used for public health decisions
IR 2. Increased availability of trained epidemiologists in the region and the training of other levels of health workers by these epidemiologists.
IR 3. Infectious disease and environmental health laboratory capacity rehabilitated
IR4. Capacity of ministries of health to design and implement community based prevention and control of disease established

Within CDC, these IR packages will involve the National Center for Environmental Health, National Center for Infectious Disease, National Center for Health Statistics, National Immunization Program, National Center for HIV/STD and TB Prevention and Control, Public Health Practices Program Office, Epidemiology Program Office, and Office of Global Health. The primary counterparts for these activities will be the Ministries of Health of the target countries. In addition, external collaborators will include the Association of Public Health Laboratories, the Training in Epidemiology and Public Health Intervention Network (TEPHINET), the USAID regional and country missions, and the Pan-American Health Organization. As activities are planned at the country level with local counterparts, other collaborations may be defined.

Many of the countries in the target region share common health and operational problems; when the subject areas overlap, training workshops will be held on an inter-country basis. During the early phases of the project, expertise will be identified in one or more of the host countries. For example, there are MPH programs in Honduras, Costa Rica, and Nicaragua where expertise in project planning may be identified. Wherever possible, CDC will follow the this hierarchy when providing technical assistance and support to target countries: (1^{st}) expertise from the country, (2^{nd}) expertise from another country in the region, (3^{rd}) staff of the regional FETP, (4^{th}) expertise from a TEPHINET country in the region (Mexico, Colombia, Peru or other), (5^{th}) CDC.

The CDC recognizes that many institutions are or will be contributing to the reconstruction efforts following Hurricanes Georges and Mitch, and that coordination among them will be crucial to assure success and avoid duplication of efforts. The CDC is committed to working in partnership with these other institutions in the implementation of this proposal. In this spirit, work plans will be developed only following consultation with USAID country offices, Ministries of Health, PAHO, and other relevant entities.

Whenever possible, CDC will promote a region-wide strategy to achieving the objectives of this proposal. The relatively small populations of these countries, their geographic proximity to one another, and the historic spirit of collaboration between them, all favor such an approach. Thus activities will occur both at the sub-regional level (potentially extending beyond the target countries), as well as the country-specific level.

II. PROJECT COORDINATION

Within CDC

Atlanta

This project draws upon expertise and proposals from a variety of CDC Centers and Offices. The overall project coordination will be provided by the Division of International Health, Epidemiology Program Office (DIH/EPO). EPO will serve as point of contact with USAID and will ensure that CDC program activities are integrated into a single cohesive program. EPO will coordinate activities of the four Immediate Result components, call regular meetings of the IR team leaders, consolidate reports and facilitate communications. EPO will be staffed full time by an epidemiologist, a public health advisor and support staff dedicated to this project and will call upon the IR Team Leaders, USAID, PAHO and other organizations as identified for membership in a Coordination Committee.

Within each IR, multiple CIO's will be called upon to provide subject matter expertise. Each IR will form a project team with representatives of the concerned technical area. The team leader will be responsible for IR specific work plans, forming the team and directing the work, day-to-day coordination with other IR teams and giving reports to the Coordination Unit and Committee. It should be noted that the formalized structure is a fallback. In reality, members of any IR team are likely to be members on the others and team leaders will be in close physical proximity to each other. Informal communication will be the best and most productive form of coordination. The CDC assignees in-country will be members of all of the teams.

In many cases, activities are listed under more than one IR. In fact, the strategic objective is envisaged as one whole with interlinking purposes, activities and outcomes. One example of this would be in Honduras where the mission has expressed interest in dengue control as the possible health priority. Should this be identified by the MOH, NCID will be called in to work with the MOH in the technical implementation of the project. They will call upon the FETP staff and trainees to assist in collection and analysis of such information related to case fatality, increased diagnostic accuracy or other operational question. The FETP and / or the HIS will collect information key to monitoring and evaluating the impact of the program on population and the FETP's can help to define and address any operational problems which occur in the implementation. In other countries, water vessels may be a control strategy in the response to outbreaks of diarrheal diseases and thus be incorporated into the epidemic preparedness and response protocols. In this case, the laboratories could play a key role in quality assurance. The FETP’s would be crucial to detecting outbreaks, assessing community support and establishing the cost-effectiveness of the strategy. The bulk of this kind of coordination will take place in-country, but the IR teams and Coordinating Committee will facilitate the process where necessary and appropriate.

Atlanta and CDC in-country

The Hurricane Project Coordination unit (centered in the Epidemiology Program Office) will be responsible for direct communication with the staff assigned to the field. The unit will collect quarterly and other reports for consolidation and forwarding as required by the project management. The Hurricane Project Coordination Unit will be responsible for coordination and

communication with USAID/Washington. However, free communication between concerned parties is encouraged.

The Hurricane Coordination Committee

CDC, APHL, OFDA, USAID, and PAHO will be members of a Coordination Committee which will 1) provide technical input for the planning process; 2) review progress towards the results and objectives on a bi-annual basis and make suggestions for improvement; and 3) assure coordination of inputs in the region. All quarterly reports of activities will be disseminated to all members of the Coordination Committee. Bi-annual meetings will be held in Atlanta and Washington on a rotating basis. PAHO bi-annual reports will be provided to CDC in keeping with the submitted work plan and provided to USAID as part of CDC reporting.

In-country Coordination

Country specific workplans will be developed in close collaboration with the respective Ministry of Health, USAID and the country PAHO office as well as other local projects. Ministries will be asked to provide office space and logistical support for the long-term resident advisor to facilitate on-going communication and capacity building. Quarterly and annual project reports will be copied to the Ministry and available to others upon request. A joint bi-annual review of progress will be done for each IR and the SO with feasible recommendations for adjustments developed that have buy-in from all concerned parties.

CDC Resident Advisors will work in close collaboration with the USAID missions. All consultants will provide briefings and debriefings as desired by the mission, workplans will be approved by them and quarterly / annual reports will be copied to them. USAID will participate in the bi-annual in-country reviews.

While the Coordination Unit will be available for backup and problem resolution, direct communication with the in-country partners will be through the Resident Advisor who would have responsibility to supervise all IR's.

Regional Coordination

There are already several bodies in the region responsible for region-wide activities, including PAHO and G-CAP. Under this Strategic Objective (SO), CDC plans to act as a resource to these bodies as requested much like it is a resource to the individual Ministries of Health in-country. Any meetings and activities will be coordinated with them, technical assistance for e.g. regional maps of disease incidence, regional strategies for control will be provided to them. The exact counterparts and mechanisms for communication and action will be determined after the planning visits in the region.

One of the 2 FETP epidemiologists will be designated the senior coordinator for the regional activities and will be responsible for coordinating the on-the-ground activities that have a regional application as well as being a resource for the other epidemiologists. This person will be

responsible for calling the Regional Meetings or responding to those called by PAHO. The senior coordinator will call bi-annual technical meetings of the CDC staff and their counterparts to monitor project activities and provide a forum for sharing experiences. Given the essential role of PAHO in regional activities, this epidemiologist will communicate directly with PAHO / Washington and other regional entities with copies to the Coordinating Unit about these activities.

III. INTERMEDIATE RESULTS

INTERMEDIATE RESULT 1: HEALTH INFORMATION AND DISEASE SURVEILLANCE REHABILITATED AND INFORMATION USED FOR PUBLIC HEALTH DECISIONS

STATEMENT OF THE PROBLEM

In the wake of the Hurricanes, the Ministries of the affected countries found themselves without an adequate information base and without the infrastructure and sometimes the skills necessary to identify and control outbreaks of preventable diseases. The Ministries were and remain unprepared to handle this type of complex emergency without assistance from international agencies. The Health Information Systems of the countries, which include assessment of the health status of the population and surveillance of diseases for immediate notification of epidemic potential, remain inadequate to allow the Ministries to identify health problems in a timely fashion and to prioritize areas for intervention.

The Data for Decision-Making (DDM) project has developed proposals for improvement of the Health Information Systems with the Ministries of Health in Nicaragua (before the Hurricane) and in Honduras. Since the Hurricane, we have contacted them ,through the USAID missions and directly, to confirm their continued interest and support. The proposals in both countries were developed in consultation with the local office of PAHO and plans have been shared with their Washington office. Contact with Ministries in Guatamala, El Salvador, Haiti, Costa Rica and the Dominican Republic has just begun. The first step in this plan will be to visit each country and fully describe the project, its strategies and to begin steps toward the development of detailed implementation plans. These plans will reflect the needs of the Ministries, the overlap between countries, the potential for inter-country and regional activities and coordination with other agencies and donors. Each country has many projects in place that link with this proposal and each will want to select those elements most helpful to them in reconstruction and development of useful, valid and reliable health information systems linking to public health action. DDM projects are always customized to the needs expressed by the host country.

For the last 20 years, CDC has collaborated in the establishment of applied epidemiology training (called Field Epidemiology Training Programs, FETP) and Public Health Schools Without Walls (PHSWOW) in 21 countries. In addition, CDC has collaborated with Ministries of Health throughout the world to develop Data for Decision-Making Projects (DDM), often in

conjunction with Field Epidemiology Training Programs. These programs assist Ministries to improve access to information through the health information systems and to improve their capacity to analyze, interpret and act upon the information. Increasingly these two projects are implemented together to ensure that professional epidemiology links with clinical health workers, decision-makers and public health program staff.

There are two programs that CDC is developing for domestic public health purposes that may be quite useful in the context of this project. First is an integrated information and communication system to aid health emergency communications, disease surveillance, epidemiologic investigations, electronic laboratory reporting, distance-based training, and other, critical public health functions for state and local health departments in the United States. This system is based on two models - the Information Network for Public Health Officials and the Health Alert Network. The Information Network for Public Health Officials (INPHO) enables state and local health departments to strengthen electronic infrastructure to improve public health practice. The emerging Health Alert Network will assist national and local health departments in preparing for and responding to infectious and environmental events (such as disasters). The proposal for a public health Early Warning System (EWS) will incorporate these models to meet the needs of the participating Ministries of Health in developing electronic communications infrastructure.

The second program is called the Assessment in Public Health Initiative. This program is based on the 1989 report by the Institute of Medicine (IOM) that recommended improved assessment capacity by local health authorities as one of the most pressing needs in public health. This initiative works with local health and government units within the United States to increase the abilities of local communities to use data and plan relevant health programs. Many innovative strategies have been tried and will be available for the countries in this project for consideration as applicable.

RESULTS FRAMEWORK

The following Results Framework is proposed to help achieve the Strategic Objective of " Re-establish and sustain the capacity for assessment of health status and the early detection and effective response to outbreaks and changes in disease patterns ".

Result 1.1 - Effective health information system re-established and regional system enhanced

1.1.1 HIS in place and strengthened in 6 countries

Indicators

- Assessment tool and priority setting exercise developed for use in target areas.
- Interviews show that decision-makers have used the information from the selected information or surveillance systems to determine priorities, allocate resources, respond to outbreaks or emergencies, prepare annual or other plans
- The health information system provides data that is more timely, more accurate, has predictive value positive and is used for to guiding public health response and action.

- Data from the health information system developed has been or will be used by International and/or regional health organizations (PAHO, UNICEF, or others) in reports for distribution.

Activities (illustrative)

- Assessment tool developed based on CDC and WHO protocols and expert input.
- Evaluate the information and surveillance systems in each country (define baseline characteristics of key information systems—timeliness, usefulness, sensitivity, flexibility, simplicity etc.)
- Determine priority health information needs in each country
- Identify information gaps
- At least one priority component of the health information system will be selected for substantive improvements
- Develop country profiles (health status baseline, health determinants and risk factor descriptions and goals set for the next years) for major diseases
- Design specific projects to improve existing health information and surveillance systems to meet information needs, including multi-directional flow of information, roles and responsibilities for reporting and actions, laboratory support to HIS functions and needs for infrastructure and equipment
- Assist in health risk mapping for priority health problems
- Reinforce capacity at central and decentralized levels to implement improvements in the information system. As an example, improved national capacity to analyze data.
- Identify existing capacity by level of expertise in community and involve them in the information gathering and design of formats for information coming back to them.
- Link local projects and country programs with Assessment initiative in the US if requested.
- Regional scientific conferences on information systems for FETP's, TEPHINET, and PAHO.

1.1.2 National and regional capacity to detect health problems, collect information, analyze data, and respond to information enhanced

Indicators

- Improved timeliness of reporting and analysis for selected health information program at National level
- Regional institution (PAHO or other) receiving weekly and monthly reports from all member nations within specified time limits
- maps of epidemiologic corridor prepared and disseminated regularly
- plan of action for control and prevention of diseases across borders prepared
- number of outbreaks of infectious diseases detected and responded to by national and local health staff increased
- Recommendations based on health investigations used to improve health or decrease risk in at least half of all investigations

Activities (illustrative)

- Identify and assist in development of national and regional capacity to receive and process health information
- Clear guidelines developed for how information will flow from peripheral to national levels for selected information systems including forms, and communication criteria
- Secondary (informal) information systems developed to enhance disease detection using community reporting (clinical care workers, community reporters, media and others).
- Develop regional profiles for major diseases (at least one per country)
- Assist in risk mapping on regional basis for priority health problems
- Analyses of data at each level will be specified and training to enhance this capacity will be provided by National and regional health staff including the FETP

1.1.3 MOH capacity to plan and implement effective strategy for communications of scientific information enhanced, including links with existing PAHO, WHO, and other FETP public health bulletins.

Indicators

- Public health bulletins produced and distributed on a regular basis
- Articles submitted to peer review journals from each FETP trainee (38 over 3 years)
- MOH ensuring a yearly line item funding to continue the production and distribution of each country's bulletin.
- Yearly production and publication (in paper and electronic form) of country health profile
- Developed and implementation of national and regional communications strategy using variety of media
- Inter-country publication of data established and functioning
- Decision-makers have access to appropriate country and inter-country information in timely fashion

Activities

- Review and assess all in-country public health and laboratory bulletins, in-country communications systems that could assist in the linking and distribution of bulletin communications, links to secondary information distributors such as newspapers, radio, television, and established in-country network systems for all participating countries and regions. Develop a written report of the findings of recommendations to improve both paper and electronic public health communications.
- Produce a comprehensive strategic communication plan for each country to include print and electronic production, management, marketing, and distribution by

appropriate means with the utilization of existing distribution channels such as radio, television, Internet, newspapers, community bulletins, and magazines, etc.
- Provide communication training for participant(s) in each country/program on topics such as writing for scientific publications, desktop publishing, production, distribution and evaluation
- Support the communication unit in each country through training and networking opportunities
- Support publication of bulletin and assess cost recovery and sustainable funding for bulletin after Year One
- Provide assistance as needed to regional information sharing.

Result 1.2 – Plan for effective public health Early Warning System (EWS) developed

1.2.1 - Preliminary assessment of the functional needs of the public health Early Warning System completed by the end of six months.

Indicators

- EWS team established according to MOH needs and requirements
- Assessment report listing potential users, functional needs, description of proposed content, and description of EWS operational parameters completed.

Activities (illustrative)

- Establish a collaborative project team representing PHPPO, EPO, PAHO, and the participating Ministries of Health
- Define the users of the EWS
- Define the needs to be addressed by the EWS, e.g., emergency health notification and communication, emergency preparedness and response, data collection and exchange, surveillance, access to guidelines and databases, in-service training, and electronic laboratory test reporting
- Define the data, information and other content to be included in the EWS
- Define the operational parameters of the EWS. (e.g., available communication systems, 24/7 accessibility, bandwidth requirements, security, etc.)

1.2.2 - Public health EWS plan to serve as a blueprint for future implementation and a tiered approach to development of electronic communications infrastructure completed by the end of one year.

Indicators

- EWS critical components identified
- Assessment document identifying the gap between existing and needed capacities completed
- Model plan developed and delivered

Activities (illustrative)

- Identify critical EWS components to be addressed in the plan.

- Assess existing capacity to support defined functional needs (e.g., information/communications systems, human resources, management and organizational systems, etc.)
- For each critical EWS component develop a plan to fill gaps between existing and needed capacities
- Prepare a model plan to meet the functional needs of the EWS, suitable for modification to address unique needs of the participating MOHs

Result 1.3 - Surveillance information is being used

1.3.1 to guide prevention and control programs (see IR 4)

Indicators

- Project and program plans at all levels of the health care system are based on accurate, scientifically valid information
- Project and program plans are funded
- Appropriate telecommunication methods to effectively distribute vital public health information developed

Activities (illustrative)

- Training needs assessment at district and central levels
- Adapt and develop Spanish training materials per needs assessment
- Implement competency-based training program
- Provide support and follow-up for data use
- Identify 1 – 3 priority health problems / country plus one regional health priority
- Assist counterparts in development of appropriate, cost – effective, effective strategies for the control or prevention of 1-3 priority health problems

1.3.2 - for epidemic preparedness and response

Indicators

- Diseases of epidemic potential reported within 48 hours or per national guidelines
- Defined **c**ontingency stocks in place
- Response to suspected epidemics occurs per national guidelines

Activities (illustrative)

- Assess the existing capacity in conjunction with 1.1
- Define roles and responsibilities for epidemic detection, preparedness and response (see 1.1)
- Develop guidelines for epidemic preparedness
- Develop a comprehensive plan to upgrade existing notification systems
- Designate Epidemic Committee members
- Determine needs for contingency stocks
- Disseminate guidelines and train as needed
- Implement preparedness plans

Indicators will be tracked through monthly, quarterly and annual reports. In addition, a final evaluation will be programmed for 3 years after the completion of the project providing resources are identified. A table with indicators, etc. is in the annex.

APPROACHES TO BE USED

In this document, the term Health Information System (HIS) describes the on-going provision of valid information needed for assessing health status, defining public health priorities and monitoring programs to Ministry of Health decision-makers. It includes:

- immediate / weekly notification of diseases of epidemic potential or diseases targeted for eradication / elimination
- laboratory confirmation for a subset of the diseases under surveillance
- monitoring disease trends on a monthly basis for determining progress compared to established goals and objectives
- identification of needs for supervision and support
- identification of seasonal trends, etc.
- in-depth information on epidemiology of specific priority problems through sentinel surveillance and surveys
- demographic information on population and infrastructure, and other information on an annual basis
- some management information (such as vaccination coverage) to aid in monitoring programs.

A Health Information System is not considered complete unless the information responds to the needs of decision-makers and is being used to improve health programs.

An essential link between data generation and data use is communications. Information must be available to the right people at the right time in the right form to be used. This program will work with Ministries of Health and PAHO to train a cadre of public health communicators. Working with these counterparts, CDC will assist them develop comprehensive communications plans for all priority health programs and the Ministry of Health as a whole. These plans will identify target audiences and the most appropriate means of communicating health information to them. All media will be considered, including print bases, electronic transmission and internet as feasible and appropriate. Communications being key to action, training in writing, advocacy, dealing with the media and communications management will also be provided to the cadre and to other technicians directly responsible for generating data or program management.

DDM projects have successfully taken the analytic skills of epidemiology training programs, combined with communications and managerial skills, to improve the use of scientific information at the district level. DDM has also taken the scientific base of knowledge of subject matter experts at CDC and translated it into manuals and guidelines which assist Ministries of Health in preparing for and responding to epidemics. The DDM materials developed for meningococcal meningitis and cholera have been translated into several languages and have been used by CDC, WHO and Ministries of Health in numerous countries. The approach used in these

manuals - defining roles and responsibilities, preparing for an epidemic, building capacity to detect, confirm and respond - are being applied to other diseases and systems.

Under this project, DDM will work with each country to:

- determine their information needs as determined by health priorities (health indicators)
- review sources of information - pre and post hurricane
- identify and address information gaps (whether they are due to poor design, hurricane damage or implementation problems)
- select at least one health program whose information system will be targeted and substantively changed by the inputs of the information system improvements.
- identify and address training and other needs at central or lower level for analyzing, interpreting and disseminating data to decision-makers
- identify and address information, training, support and other needs at all levels for using data to anticipate outbreaks, investigate outbreaks, respond to outbreaks, allocate resources, set priorities and manage programs.
- evaluate the use of Health Information Systems data using qualitative and quantitative approaches

Based upon the priorities set by each country, DDM will also work with the MOHs to develop data-based strategies to prevent and / or control 1-3 health problems in each. Program plans will be developed to implement scientifically sound approaches that may include changes in national level policy, facility-based services and/ or community based actions. Given the 2-year timeframe for this project, full implementation of any plan may not have been accomplished before the end of external assistance so changes in morbidity and mortality will be monitored by the MOH for future adjustments in the programs. This is further addressed under IR 4.

Because there is ease of movement between the target countries, they share many common health problems and transmission of disease across countries may pose a problem. This phenomenon has been described as the "epidemiologic corridor". A regional workshop will be held in Year One (either in collaboration with PAHO or another regional body). At the workshop, participants will:

- identify diseases and conditions of a regional importance; the information system of each country will be designed / modified to allow extraction of this information for dissemination to other nearby countries;
- determine effective communications strategies for information sharing;
- discuss the need for and form of regional response capability for public health emergencies.
- DDM will work with regional counterparts to develop maps of these health problems and of risk factors that contribute to transmission. DDM will provide technical assistance to the development of a dissemination strategies and regional response capability. Annual meetings will be held to review progress and revise strategies as well as to review the information generated by the system and recommend regional strategies for prevention and control.

The FETPs that are to be established in the region will serve as an important resource to this IR. The faculty of the FETP can also serve as faculty on DDM workshops and provide supportive

supervision to DDM participants. Traditionally, FETP has only provided training in epidemiology and communications. Increasingly, DDM modules on economics and program planning and health project management are being incorporated into the curriculum. DDM has helped in faculty development for these modules. FETP staff and trainees will be involved to the maximum extent possible (depends upon timing of recruitment) in the reviews of existing health information systems and the design of improvements. They, as well as graduates, will be essential resources for outbreak investigations during the project and after. Districts can do the initial investigation, but in-depth investigations, as well as outbreaks of uncommon diseases, will require assistance from FETPs. The manual and guidelines will be developed in close collaboration with the faculty and staff.

Depending upon the placement of the FETP within the host Ministries of Health, they may have responsibility for the notifiable disease system, other parts of the HIS and / or the bulletin. Whether or not they are directly responsible, this IR will be accomplished in close collaboration with them.

The public health Early Warning System (EWS) is envisioned as an electronic network that would link public health, medical, emergency and other organizations critical to health protection. The EWS plan to be developed is expected to provide a model the Ministries of Health can use or adapt in building the electronic infrastructure necessary to improve local and regional linkages, health surveillance support, detection of emergent health threats, emergency notification and communications, and coordinated response to health threats.

A model EWS plan will be developed to present to all five countries. There will be two phases in the development of this plan. First, an assessment, resulting in an assessment report, will be completed by the end of the first six months. Second, the EWS plan will be developed and delivered by the end of year one. The EWS plan will be tiered based on capacity level, will include a suggested course for implementation, as well as a blueprint for the development of electronic telecommunications capacity for each tier, and would be suitable for modification to address each Ministry's needs. The Ministries of Health will be responsible for the implementation of the EWS plan.

COORDINATION

DDM was invited by the USAID missions in Honduras and Nicaragua to assess the health information systems in those countries. In close collaboration with the Ministries of Health in each and in coordination with PAHO, proposals were developed for each. This same consultative approach will be employed in the development of plans for each country, as well as intra-country and regional activities.

In part, coordination will be accomplished by the Ministries of Health with CDC support. It is recommended that Advisory Committees be established / revitalized for decisions regarding the health information system. These Committees typically include representatives from various programs within the MOH, from other Ministries such as Agriculture (food production) or the Interior (vital registration), the private sector, donor agencies and implementing partners.

Other recommended Committees are the Epidemic Preparedness Committee, which includes many of the members mentioned above and the Early Warning System Advisory Committee.

Challenges to the completion of these plans will include, among others, 1) the capacity of the Ministries of Health to dedicate leadership, staff and other resources needed to undertake them, 2) coordination of these efforts in a multi-country project, and, 3) the financial and technical capacity of the Ministries of Health to implement the early warning system following completion of CDC's contribution to preparing the plan.

MANAGEMENT PLAN

The health information and surveillance system activities will be implemented jointly with the Field Epidemiology Training Program and IR4 by the Division of International Health /EPO. The project team will include representatives of DIH/EPO, the Division of Public Health Surveillance and Informatics/EPO, the Public Health Practice Program Office, NCID, National Center for Health Statistics, National Center for Environmental Health, and the Public Health Program Office, as the need for subject matter expertise is identified. The General Directorate of Epidemiology of the Secretariat of Health, Mexico has expressed interest in continuing as partners in the implementation of the project and terms of reference are to be drawn up in mid-May, 1999.

TEPHINET, the consortium of FETPs (based in Atlanta and Geneva), can offer coordination with Mexico and other FETPs in the region and elsewhere. Through TEPHINET collaboration with Peru, Spain, Colombia are already being discussed. Through a cooperative agreement with CDC, TEPHINET can therefore offer assistance in the evaluation of surveillance systems, development and implementation of training programs, evaluation of programs and rapid response to public health emergencies. DDM and DIH would be responsible for coordination of this input with the needs of the Ministries and USAID.

Developing a plan for a health Early Warning System will be led by the Public Health Practice Program Office, working in close collaboration with EPO, NCID, PAHO and the participating Ministries of Health.

The Ministries of Health of each country will have to provide the following support to the activities in order to make them sustainable. The suggested form is illustrative only and can be adjusted to suit the needs, resources and customs of each country.

- Health Information advisory committee and Early Warning System advisory committee composed of decision-makers, program managers, representatives of donor organizations, data users and providers from all levels of the health care system
- Point person for work on the systems. This should be a full-time person available to do or coordinate the evaluation, meetings of the committee, input from CDC / TEPHINET, trainings etc.

- Technical Coordinator to assure oversight of the work and coordination with other areas in the MOH, other Ministries, donors and other sectors
- Communications specialist / editor for planning and implementation of epidemiological publications and editorial committee
- Epidemic committees at national, regional and local levels - this would be a multisectorial committee responsible for coordinating the response to suspected epidemics, evaluating preparedness, coordinating preparedness and response with donor organizations, NGOs and various government agencies
- The Ministries of Health will have to establish line items in national, regional and local budgets for the costs of routine surveillance, supervision of surveillance and outbreak investigations. This may be phased in over the life of the project (2 years)

RESOURCES REQUIREMENTS

The budget for this activity follows in annex 2. The USAID mission in Honduras has put $122,000 toward this effort in their country in FY99. This was taken into account in the preparation of the budget and does not appear here.

INTERMEDIATE RESULT 2: INCREASED AVAILABILITY OF EPIDEMIOLOGISTS IN THE REGION AND THE TRAINING OF OTHER LEVELS OF HEALTH WORKERS BY THESE EPIDEMIOLOGISTS

STATEMENT OF THE PROBLEM

In the wake of the Hurricanes George and Mitch, the national Ministries of Health found themselves without an adequate information base and without the skills necessary to identify and control epidemics. The Ministries were and remain unprepared to handle these complex emergencies without outside assistance from international agencies

CDC has collaborated with Ministries of Health throughout the world to develop Field Epidemiology Training Programs (FETP) and Public Health Schools Without Walls (PHSWOW). These programs have 20 years experience in building high-quality epidemiologic capacity in 21 countries and have recently organized a coordinating organization called TEPHINET (Training in Epidemiology and Public Health Interventions NETwork). A key factor in the FETP and DDM programs is the sustainability and capacity that is left with the country, thus preparing the MOH to handle emergencies on their own in the future. Currently 17 of these programs are autonomous within their Ministries of Health have sustained funding. This technical assistance and collaboration has varied greatly depending on local need.

The FETPs and TEPHINET have been successful in developing and promoting excellent scientific epidemiology, creating public health practitioners with a field-based approach. The ability of FETPs and their graduates to respond quickly to infectious and environmental health threats makes them an important part of a Ministries public health team. For the long-term, in the

event of an emergency, a regional cadre of FETP trained epidemiologists could be on-site within hours, fully capable and trained to rapidly define the threat and program appropriate response. This is in contrast to international teams that may take a minimum of 24 hours and are not in a position to follow-up the recommendations of the investigations.

FETPs and their graduates also help Ministries develop the information necessary to develop and implement the most effective and cost-effective public health programs to address on-going health problems. They develop, maintain and evaluate health information systems that provide the information necessary to prepare for and respond to health problems. This is particularly important as countries in the Americas undergo the epidemiologic transition and increasingly need to plan broad-based health programs and include chronic and environmental health problems as priorities.

The Division of International Health, in collaboration with TEPHINET, estimates that highly qualified field epidemiologists are in greatest need at the regional and national levels of Ministries of Health. National or regional epidemiologists can act as technical advisors to program managers, they can be on hand to analyze disease trends, provide advice and assistance to districts and program managers and be available to respond rapidly to emergencies. To operate effectively, a Ministry should plan to have one epidemiologist in each region (or unit above district-level), as well as epidemiologists available to each vertical program, and the unit(s) responsible for disease surveillance, epidemic response, planning and evaluation. Based upon these assumptions, CDC estimates a need for 80 epidemiologists for the 5 target countries (Honduras, Nicaragua, Guatemala, El Salvador, Dominican Republic). The countries of Haiti and Costa Rica were not part of the initial assessments and will be considered later. This number will be refined during assessment visits to the region. The exact number needed and the number currently on staff will be clarified with the Ministries of Health. Included in the count of those available might be those employed in other sectors such as Universities, who could be considered as national resources. A comprehensive training plan will be developed that accounts for the additional epidemiologists needed to meet attrition (as staff are promoted to higher functional levels in ministries), to provide continuing education and to develop supervisory capacity.

RESULTS FRAMEWORK

The following results are proposed to help achieve the Strategic Objective of "Re-establish and sustain the capacity for early detection, diagnosis and effective response to outbreaks of emerging and re-emerging infectious diseases".

Result 2.1 - A cadre of 38 field epidemiologists will be available for assignment to national and regional level posts within the Ministries of Health

Indicators

- 35-38 epidemiologists completed the FETP training (completed competencies established by programs[1])

1 This will be an adaptation of the competencies described in Annex 2

Activities (illustrative)

- Establish 1-2 FETPs in host countries
- Sponsor FETP trainees from target countries to FETP programs in Canada, the United States, Mexico, Colombia, Peru, Spain and Cote d'Ivoire
- Identify field sites for trainees, conduct training of field supervisors
- Review / modify curriculum and training materials with MOH
- Recruit first class of trainees
- Initiate training program

Result 2.2 - Establish sustainable capacity to conduct field epidemiology training

Indicators

- host MOH established funding for program
- protocols for cooperation and cost sharing established with other target countries
- continued recruitment beyond second year of the project
- counterparts recruited from countries
- supervisors (1 per 8 trainees) selected, trained; monitoring systems for supervisors defined and in place
- number of FETP graduates retained by MOH and / or remaining in the region
- FETP graduates using epidemiology in their positions e.g. conducting annual surveillance reviews, outbreak investigations, program evaluations.

Activities (illustrative)

- Define career path of trainees and competency needs per future career responsibilities
- Identify and train counterpart FETP Directors
- Identify and train faculty for courses (as necessary)
- Design curriculum and materials to meet competency gaps
- Develop plan for cost recovery (national budget, tuition, external support)
- Establish mechanisms for accepting trainees from other countries and agreements with Ministries of surrounding countries

Result 2.3 - Establish ongoing training in core public health skills by FETP staff, graduates and trainees for key health personnel to strengthen epidemiology at the local level (see 1.3)

Indicators

- FETP staff, graduates and trainees providing training for 50-100 outlying MOH staff in basic public health skills (including maintaining surveillance systems)
- short-courses to strengthen municipal epidemiological capacity conducted by FETPs
- Timeliness and accuracy of reporting in targeted outlying municipalities improved

Activities (illustrative)

- Assess necessary skills (and gaps) for public health and epidemiology for public health workers
- Adapt short-course curriculum and materials from exisiting DDM materials and other FETP's
- Provide training for FETP staff, graduates and trainees on teaching methodology and materials development
- Recruit appropriate public and private sector personnel for training with MOH in countries
- Provide training courses for MOH staff.

The indicators above will be monitored by CDC and reported to USAID. In addition to these indicators, a number of targets and process indicators such as training sessions held, MOH and other personnel trained, will be developed at a later date.

APPROACHES TO BE USED

The flagship training of the Field Epidemiology Training Program produces high-level field epidemiologists able to perform the skills listed in Annex 2.

The strategy for applied epidemiology training starts with classroom didactic training that is provided in scheduled blocks to build necessary skills. Time is provided for peer review and presentations, and to strengthen networks of epidemiologists within and across countries. Typically, a class (cohort) starts with a 3-4 week introductory course in basic epidemiology, biostatistics, communication, management, and an introduction to surveillance systems and field investigations. Trainees then join their field sites where they work with supervision. During the 2-year training, 60-70% of the time is spent in the applied field training. Participants must evaluate a surveillance system, investigate an outbreak, undertake field studies, communicate to an audience of decision-makers and demonstrate that some of their recommendations have been adopted. The need for these tasks is carefully coordinated with the Ministry of Health such that the trainee is fulfilling an identified need even during their training.

In the case of the Central American FETPs, the trainees will be coming from the host countries, but also from 3-5 additional countries. It is important that trainees return to their own countries and perform learning activities that are of service to their own Ministries. At the same time, close supervision must be available to assure the quality of the learning experience. Early in the project, field supervisors from all 5-target countries will be identified and trained. They will receive technical backstopping from the in-country CDC staff for the duration of the project. Supervision of trainees will be further reinforced by regular visits to all countries by FETP staff and bi-annual meetings of trainees, staff, and field supervisors in the region. Ministries will be consulted regularly and given ample opportunity to provide feedback, both on an on-going basis and during the annual meetings.

Faculty, staff, field supervisors and resources will be drawn from the following in order of preference: expertise from the country, expertise from another country in the region, expertise

from a TEPHINET country in the region (Mexico, Colombia, Peru, Canada, USA), CDC. The mechanisms for coordinating this are described in other sections.

In addition to the full training for field epidemiologists, Ministries typically need to improve the abilities of their staff to collect, analyze and use information on an ongoing basis. These needs are typically addressed through shorter courses that can be offered by the faculty of an FETP, often with FETP trainees serving as faculty for these workshops. It is anticipated that the need for these programs will be identified and addressed in conjunction with the DDM portion of the project (IR 1).

The first step in the development of a Central American FETP capacity would be an assessment visit to the affected countries. An FETP represents a significant on-going commitment on the part of a Ministry of Health. During the initial years of a program, the MOH devotes time from full time staff as faculty and staff. Qualified staff and the infrastructure must be identified. The Ministry of Health must continue to pay trainees their full salary during the 2-year program. It must defined a logical career path and provide some assurance that graduates will have the opportunity to exercise their acquired skills. Plans have to be made to assure that when external support ceases, the programs can continue. This requires commitment from the host country to pay for salaries for trainees and trainers, and ancillary costs such as computers for trainees and costs for outbreak investigations. To date the majority of CDC FETP programs continue to function as sustainable national programs. In addition, this is envisaged as a regional program, serving the needs not only of the host country, but accepting trainees from surrounding nations, implying financial contribution and commitment from non-host countries.

Since the early 1990's CDC has been in contact with staff from the Ministries of Health of Dominican Republic, Guatemala, Nicaragua, and Honduras to assist in the development of increased epidemiologic capacity. In 1994, CDC had held discussions with several programs in the region and developed plans for an FETP program based in INCAP in Guatemala, funded by PAHO. Though that did not work out at the time, interest in the training program has remained. The Division of International Health has continued to enjoy good relations with PAHO and with the countries in the region. Since Hurricane Mitch, TEPHINET was able to organize a response in Honduras using staff and trainees from Central and Latin America programs. TEPHNIET members participated in the design of a surveillance system for Honduras. They also fielded a team for a cholera outbreak in El Salvador and assisted in several PAHO sponsored and organized workshops on outbreaks investigations.

COORDINATION

DIH will develop the implementation plan for the FETPs in close collaboration with the Ministries of Health in each and in coordination with PAHO, other donors and agencies. This same consultative approach will be employed in the development of plans for intra-country and regional activities.

CDC will work with the Ministries of Health to develop coordination mechanisms between the FETPs and the Ministries and between host countries and others who will be sending trainees. It

is important that trainee's learning experiences be identified with the Ministry, such that they reflect their priorities and that the trainees provide service to the Ministry even while completing their training.

Accomplishment of this IR and IR's 1 and 4 are proposed in collaboration with TEPHINET, the consortium of FETPs. TEPHINET has an Executive Secretariat in Atlanta, co-located with DIH and a regional office in Peru for Peru, Colombia, Mexico, Canada and the USA. Coordination and collaboration are facilitated by regular meetings with the Atlanta staff and frequent phone and electronic communications with the other offices.

Challenges to completion of these plans will include, among others,
- the capacity of the Ministries of Health to dedicate leadership, staff and other resources needed to undertake them
- coordination of these efforts in a multi-country project, and,
- the financial and technical capacity of the Ministries of Health to implement the sustained training program once external support has ended.

MANAGEMENT PLAN

This activity will be implemented jointly with IR's 1 and 4 by the Division of International Health /EPO. The project team will include representatives of DIH/EPO, the Division of Training/EPO, NCID and other CIO's as the need for subject matter expertise is identified.

TEPHINET, the consortium of FETPs based in Atlanta and Geneva, can offer coordination with the other FETPs in the region and elsewhere. Through a grant or cooperative agreement with CDC to be established under this project, TEPHINET can therefore offer assistance in placing trainees in established programs, faculty for training of trainers and of supervisors, and possibly opportunities for supervised experience outside of the targeted countries. DIH would be responsible for coordination of this input with the needs of the Ministries and USAID.

The Ministries of Health of each country will have to provide the following support to the activities in order to make them sustainable. The suggested form is illustrative only and can be adjusted to suit the needs, resources and customs of each country.
- Nomination and financial support for FETP staff
- Financial support (increasing percentage thereof) for operational expenses of on-going program, including field investigations
- Salaries of trainees during the 2-years of the training

In the experience of the DIH, it will take approximately 6 months to establish agreements with the MOHs, develop a suitable curriculum and training materials (Spanish), recruit faculty, staff and field supervisors, recruit and start-up the first class of trainees. A second class can begin the following year. CDC staff must remain in-country until the graduation of the 1st class to lend technical support to the host and other country governments. These graduates can then take over the functions of the field supervisors, the counterparts can take over the training and continuing education of the epidemiologists and maintain the short-courses. Therefore, this proposal

remains a 3-year plan. This model has been proven successful in a variety of other countries and settings and it is considered inadvisable to short-cut the FETP design.

RESOURCES REQUIREMENTS

The attached budget was developed with the following assumptions:

MOHs will commit to the following:
- payment of a counterpart FETP Director
- payment of salaries and travel expenses for 16 trainees
- payment of extra time and incentives for 10-16 field supervisors

Project monies will be used for the following local expenses:
- staff and start-up for FETP office
- travel for all staff and trainees to investigations and in support of field supervisors
- computer hardware and software for office staff and all trainees
- workshop expenses for training of supervisors, training of trainers and FETP classes
- consultation fees from TEPHINET countries
- attendance of trainees and staff in international conferences

INTERMEDIATE RESULT 3: INFECTIOUS DISEASE AND ENVIRONMENTAL HEALTH LABORATORY CAPACITY REHABILITATED

STATEMENT OF THE PROBLEM

The countries significantly affected by Hurricane Mitch (which include Honduras, Nicaragua, Dominican Republic, Haiti, Guatemala, and El Salvador) have sustained enormous damage to their entire public health infrastructure, including their public health laboratory capacity. The exact extent of the damage is difficult to assess, especially since information about the baseline capacity is scarce. Some reports have indicated that nearly 30% of the health infrastructure was destroyed or damaged. Honduras and Nicaragua, were the two most affected countries with significantly more damage. The negative consequences of Hurricane Mitch on public health laboratory infrastructure have included the following:

- Physical impact of the hurricane on laboratory infrastructure,
- Increased demand for laboratory services as a result of contamination of drinking water supplies, infectious disease outbreaks, and disruption of services, and
- New and emerging disease and exposure threats as a result of the hurricane that require expertise and technology not yet available in the affected countries.

Endemic and priority diseases of concern to these countries for which laboratory support is necessary include the following: diarrheal diseases, malaria, dengue fever, acute respiratory infections, parasitic diseases, cholera, Venezuelan equine encephalitis (VEE), leptospirosis,

schistosomiasis, yellow fever, and hantavirus. In the immediate post-hurricane period, outbreaks of malaria, cholera, and leptospirosis have occurred. Additionally, the capacity to address environmental concerns regarding food and water safety is critical.

WHO recommends that all countries should have the ability to provide laboratory diagnosis of "common" diseases endemic in their areas and the ability to refer specimens from suspected "uncommon" diseases to an appropriate reference laboratory. However, pre-existing laboratory infrastructure in the region was deficient, as shown by laboratory assessments carried out in the region in recent years by PAHO and the Association of Public Health Laboratories. Following the hurricane, an assessment of the public health laboratory situation in Honduras has been conducted. Specific needs that were identified include the need for facilities infrastructure improvement, essential equipment, staff training, reference materials and guidelines. Only with such support would the laboratory be able to assume the full role demanded of a laboratory in emergencies such as that which they have faced with Mitch.

In contributing to this proposal, the CDC Dengue Branch has focused only on Honduras since it has greatest familiarity with this country and understood it to be the most severely impacted by Hurricane Mitch.

The existing dengue diagnostic laboratory serves all of Honduras and is currently located in crowded facilities in the Hospital Escuela in Tegucigalpa. A new virology laboratory, approximately 95 percent complete, has been under construction for several years and has laboratory space designated for dengue testing. Partial funding has been identified to complete this facility which suffered damages from Hurricane Mitch but additional funds are needed for installation of a reserve water supply system and other items before the facility can be occupied. Discussions with the director of this facility and staff at the USAID mission and Pan American Health Organization (PAHO) office in Honduras about this new facility have revealed that the Ministry of Health (MOH) of Honduras is very interested in having this laboratory operational as soon as possible.

Given the destruction reported from the countries impacted from Hurricane Mitch, it is acknowledged that public health laboratory and surveillance systems suffered great setbacks. Ensuring a well-equipped, well-trained network of public health laboratories in the Central America region will promote information sharing and help establish a plan of action in case of future emergencies. It is clear that each targeted country has a unique system in which laboratory rehabilitation, capacity building and surveillance capabilities need to be evaluated for post-Mitch enhancements. Designated central or national laboratories for each country will be the primary focus for rehabilitation and training in this project.

RESULTS FRAMEWORK

CDC, in concert with the Association of Public Health Laboratories (APHL) and PAHO, plan to respond to these issues. CDC's National Center for Environmental Health and the National Center for Infectious Diseases both have laboratory expertise and are recognized experts in laboratory research. However, neither Center has the experience or sufficient field staff to provide the necessary rehabilitation services to the countries impacted by Hurricane Mitch. CDC

plans to partner with APHL through the award of a cooperative agreement for the implementation of IR 1. (See Annex 1 for background information on APHL).

The focus of these objectives is to ensure that these countries health systems are prepared for future natural disasters or catastrophes, by enhancing the laboratory capability to detect and diagnose diseases and environmental threats associated with such disasters. These activities will also enhance the current health infrastructure to ensure the maintenance of capacity to monitor and control endemic and/or emerging infectious diseases. The following results framework is suggested.

Result 1.1 - Public health laboratory network within and between the six countries established.

Indicators

- Plans of action developed with each country specific to high priority infectious disease and environmental health detection, control and prevention strategies
- Communication pathways developed and strengthened between country central and peripheral public health laboratories
- Sharing of data, resources, best practices and training between countries
- Regional full coverage for disease epidemics in the Central America region to rapidly detect disease, access and share data and mount an appropriate response to disease threats established

Activities

- Conduct in-depth assessment report of specific country requirements and priorities
- Evaluate the effect Hurricane Mitch has had on health system infrastructure, disease incidence, and laboratory facilities and equipment conditions
- Coordinate and conduct two meetings per year of key public health laboratory personnel from each country's central and peripheral laboratory
- Conduct one meeting per year of key central laboratory staff of six countries
- Develop working plans for inter- and intra- country information sharing, training, and consultation

1.1.1 Country laboratory "Centers of Excellence" identified and established

Indicators

- Centers of excellence will be established to potentially serve multiple countries, and provide on-site training, reference laboratory services, surge capacity and consultation in specific disease categories
- Each these centers will have expertise and experience in specific disease management (e.g. Honduras and Dengue)

ACTIVITIES

- Identify country central public health laboratories which can serve as reference and training centers for specific diseases
- Provide appropriate resources and consultation to central laboratories to serve as the "Centers of Excellence" in the region
- Establish mechanisms which allow for laboratory exchange between Centers of Excellence (e.g. laboratorians from El Salvador trained in Honduras laboratory in dengue)

Result 1.2 –Central and/or peripheral Public Health Laboratory infrastructure enhanced to meet essential requirements

1.2.1 Laboratory facilities enhanced to meet essential requirements

Indicators
- Rehabilitation of the public health laboratory infrastructure to minimally return to pre-hurricane conditions with additional capacity building as possible
- The building housing (minimally) the central laboratory should be configured to provide adequate and appropriate facilities for a biosafety level 3 containment hood for safely working with infectious agents such as *Mycobacterium tuberculosis*.

Activities
- Identify need for facilities repair and upgrade
- Determine baseline requirements for enhancements
- Document country requirements for laboratory rehabilitation and support, and provide recommendations and plans for improvement
- Advice in appropriate repairs and upgrades necessary for the functioning of essential equipment and employee safety
- Provide consultation for identified facility upgrades

1.2.2 Public health laboratory equipment enhanced to meet testing needs

Indicators
- Laboratory tests that are cost effective, easily and rapidly performed, efficient, and adaptable instituted in central laboratory
- Process developed for the continued review of the tests and equipment used at all levels
- Installation, maintenance and appropriate use of equipment for testing needs
- Use of appropriate equipment to provide the protection of laboratory personnel and the immediate laboratory environment from exposure to infectious agents.

Activities
- Develop a short and long term program plan for equipment replacement and augmentation
- Determine priority needs, issues related to purchasing and shipment and proper use of equipment.
- Purchase equipment in conjunction with training programs (as necessary) that address appropriate use and application.

- Purchase equipment with appropriate performance specifications, dimensional specifications, electrical specifications, delivery requirements, installation requirements and suggested vendors
- Provide equipment through country distributors with extended service and repair contracts whenever possible.
- Ensure training of laboratory personnel on appropriate use of equipment

1.2.3 Laboratory supplies and reagents available in sufficient quantities for testing

Indicators
- Adequate mechanisms for procurement, storage of laboratory supplies and reagents established
- Joint, unified plan for the acquisition of test kits and instruments by the public and private sector laboratories developed
- Dialogue with Ministries of Health to encourage long term commitment of funds for laboratory materials and supplies

Activities
- Identify governmental or non-governmental organizations capable of mobilizing emergency supplies of drugs, diagnostics, vaccines, or antisera
- Determine which vaccines, drugs, or diagnostic reagents are presently available, and what surge capacity would be required for their production, distribution, and use.
- Identify key Laboratory and Ministry of Health leaders to meet and discuss a consistent supply of reagents, etc. for laboratory testing

Result 1.3 – Quality assurance and quality control operations developed and adapted to each country

Indicators
- Central and/or peripheral laboratories to have current standard operating manuals and plans for high level operations
- Central and/or peripheral laboratories to have documented laboratory safety instructions
- Laboratory procedure manuals, plans, and guidelines developed for each country
- Public health laboratory functions for central and peripheral laboratories documented
- Appropriate shipping and packaging of specimens procedures adopted
- Adequate mechanisms to provide environmental testing instituted
- Proficiency testing program established
- Comprehensive laboratory evaluation program established.

Activities
- Develop or adopt a Safety/Operations manual that identifies the hazards that will or may be encountered, and which specify practices and procedures designed to minimize or eliminate risks.

- Implement evaluation program necessary to assure the quality of pre-analytical, analytical and post-analytical phases of laboratory testing
- Document standard methods for critical tests, guidelines for specimen collection and transport, patient test result management and record keeping, etc.
- Assist in the development of core functions document which identifies capabilities and capacities of central and peripheral laboratories
- Administer a pre-test/post-test for trainees to illustrate impact of training program
- Revisit and evaluate laboratories to assess level of implementation and progress of training received

Result 1.4 – Central and peripheral laboratory personnel prepared and trained for testing specimens of priority disease areas and reporting results in a timely fashion

Indicators
- APHL will provide training for key laboratory staff in laboratory skills as necessary

Activities (illustrative)
- Assess necessary skills (and gaps) for public health and laboratory services
- Develop short-course curriculum and materials.
- Recruit appropriate public and private sector personnel for basic laboratory and surveillance system training with MOH in countries
- Facilitate and/or provide training in areas such as laboratory procedures, lab support services, management and operation, proficiency testing, environmental testing, and disease management
- Deliver teaching seminars and workshops in specified training areas
- Provide training resources and/or access to materials for future training

Result 1.5 - Country and regional plans of action to prepare laboratories to handle surge capacity in emergency situations

Indicators
- Developed mechanisms to handle complex emergency situations of infectious disease outbreaks
- Established relationships with countries to seek assistance when necessary (e.g. from Mexico's national reference laboratory, Instituto Nacional de Diagnostico y Referencia Epidemiologio)

Activities
- Develop disease specific plans of action to establish procedures for handling surges in laboratory activities

- Collaborate with regional laboratories and with PAHO to establish relationships between laboratories in the region for future disaster situations, disease outbreaks, etc.

Result 1.6 - Dengue training and proficiency testing capacities for Honduras established

Indicators

- Ensure that all testing sites have a continuous, high-quality laboratory diagnostic capability in diagnosing dengue
- Establish satellite laboratory facilities established to test for and diagnose dengue in the cities of San Pedro Sula, La Ceiba, and Choluteca
- Regular production of critical reagents for the diagnosis of dengue instituted
- Process for the distribution of reagents to other Central American countries established

Activities

- Send three laboratorians to the Dengue Branch of CDC in Puerto Rico for training in the serologic, virologic and molecular diagnosis of dengue
- Involve trainees in the ongoing proficiency testing program that CDC and PAHO conducts annually with 25 participating dengue laboratories in the Americas
- Consultation and on-site assistance from the CDC to produce stocks of reagents in the new central laboratory facility
- Establish mechanisms which allow for the production and distribution of reagents to regional laboratories

APPROACHES TO BE USED

Much of the activities of this project rely on the results of an in-depth laboratory assessment. In assessing country public health laboratory functions, several basic reference documents including APHL reports on public health laboratory organization and a 1994 World Health Organization (WHO) publication on health laboratory services can be used to guide the analysis and derive recommendations appropriate to laboratory operations.

Although public health laboratories may be defined generally by certain core functions, there are many, often significant, operational differences among them. These differences are related to patterns of disease morbidity and mortality of the populations served, resource availability, the level at which the laboratory operates within the health care system (national, regional, or local), public priorities and other social and economic factors. These are all factors for review and consideration to impact public health laboratory practices within a given country.

For this project, an assessment team will be established to work specifically with each country to evaluate the effect Hurricane Mitch has had on health system infrastructure, disease incidence, and laboratory facilities and equipment conditions. It is essential that the team acquires a more complete understanding of the public health system, public health concerns/problems and the current laboratory support services so that a more appropriate assessment can be accomplished. To accomplish this, a written pre-assessment document will be completed by select country representatives and evaluated prior to the on-site visitation. The assessment team will consist of U.S. State Public Health Laboratorians, APHL staff, and local

participation by the MOH and key leaders at the country level. Initial assessments are to pay special attention to HIV among STDs, as this information would be helpful to USAID's regional Central America HIV Prevention Initiative. The laboratory assessment team(s) will coordinate visits with other project participants.

The country specific assessment team will examine the current public health laboratory system and practices, and develop recommendations and plans for improvement. Project leaders will meet with public health officials and laboratory personnel in examination of existing infrastructure and identification of prioritized needs. The assessment team will travel to country central and peripheral laboratories to:

1) obtain a better understanding of the training needs of public health laboratorians;
2) review the existing laboratory facilities;
3) determine the scope of laboratory services provided at the jurisdictional levels;
4) obtain an understanding of the political and social interactions which affect public health practice;
5) observe the degree of interaction between epidemiology and laboratory programs at all levels; and,
6) gain a better understanding of the public health problems of the country. In this assessment, special attention will be paid to concerns and effects left by the devastation of Mitch.

Furthermore, the assessment visit will evaluate current laboratory testing practices in the areas of bacteriology, parasitology, sexually transmitted diseases, mycology, virology, clinical chemistry and environmental testing (including laboratory testing in water bacteriology, water chemistry, pesticides/herbicides, organics, inorganics, heavy metals). In particular, the team will consider laboratory rehabilitation issues that are a direct result of Hurricane Mitch damage. The assessment will also evaluate the extent or availability of standard operating procedures, manuals of methods, quality assurance plans, safety guidelines, safety equipment and infectious waste disposal guidelines. Determinations will be made if the facilities, equipment, personnel and supplies are adequate for the services provided. This will include a look at existing space, utilities, safety features, reagents/supplies and instrumentation. An evaluation and discussion on the needs to improve the public health laboratory services will be provided.

As a result of the assessment trip, a plan of action (for laboratory rehabilitation and enhancement) will be developed collaboratively with each country specific to high-priority infectious disease and environmental health detection, control and prevention strategies. This program plan will be developed for establishing and maintaining essential equipment and facilities to ensure high-priority, quality testing. Over the duration of the project period, APHL and CDC will purchase, ship, and install appropriate equipment and necessary upgrades and repairs.

Based upon assessment reports provided by APHL, program plans for equipment purchase and training workshops and/or materials will be discussed with CDC project leaders, MOHs, PAHO, and USAID resident missions.

A specific objective-based curriculum for training will be developed focusing on priority laboratory needs. Such training will focus on areas identified and agreed upon by APHL assessment team and other project leaders. Training will be provided both in-country and in U.S. public health laboratories using short-term courses and hands-on workshops. Pre and post tests will be taken when appropriate.

Senior laboratory technicians may be selected to travel to U.S. State public health laboratories to participate in high priority training program. Training may include: 1) public health laboratory operations and management; 2) surveillance/epidemiological investigations; 3) laboratory safety; 4) data management and other identified areas, as necessary.

In-country training of laboratory scientists will include teaching seminars and workshops in specified training areas. These training activities will be held in the country making the request and at suitable locations determined by project leaders, PAHO, and MOH. Results of the on-site visit will be used to define the logistics of provision of APHL services in, and outside, the country.

To further develop inter and intra-country collaboration, APHL will develop mechanisms for the exchange of information and technical training between and amongst countries in areas such as chagas and dengue.

In collaboration with the various MOH, USAID missions, and regional PAHO offices, an Emergency Preparedness Plan will be develop after the assessment reports. The meetings that were mentioned above will also serve as a open forum to discuss issues related to emergency preparedness. In these meetings, leaders will discuss and determine the readiness of country laboratory systems in case of emergency threats. APHL staff and members will oversee activities related to plan development.Based upon the priorities set by each country, the technical training and consultation will provide the country laboratory technical supervisors and senior technical staff with the necessary skills to perform tests and to make technical decisions regarding the tests that will be needed. These in-country and U.S. based training programs will address high priority training needs to assist in the development and provision of quality assured laboratory services for the diagnosis and management of disease. Training manuals and materials will be provided in such programs.

APHL will work with each country to:

- Determine laboratory priorities
- Identify and address issues which constrain quality laboratory practice
- Identify and address training and other needs for analyzing and interpreting laboratory samples
- Identify and address the role of the laboratory in disease outbreaks
- Hold training workshops to address issues related to quality assurance, quality control, and laboratory safety

COORDINATION

Project leaders of each participating institution will handle coordination of each step. Specifically, centralized meetings between project leaders and country participants will discuss project status, limitations and obstacles, next steps, and further coordination efforts as necessary. In close collaboration with the Ministries of Health, and in coordination with PAHO and USAID, APHL staff and members along with CDC representatives will coordinate project activities.

In order to initiate discussions of an inter-country laboratory network system, regular meetings every year in a centralized location will occur. Approximately 3 leaders from each country and representatives for USAID, CDC, PAHO, APHL and other partners will meet to discuss findings and next steps in the development of a laboratory network.

MANAGEMENT PLAN

The Association of Public Health Laboratories will implement this intermediate result under a CDC cooperative agreement. This activity will be implemented with a collaborative effort between the National Center for Environmental Health (NCEH), Division of Laboratory Sciences (DLS), and the Association of Public Health Laboratories (APHL). The project will include consultation and input from the National Center for Infectious Diseases (NCID).

Consultation and training activities will be implemented jointly with NCEH, DLS, NCID, APHL and the Public Health Program Practice Office (PHPPO). Laboratory support and quality assurance functions will be a joint collaboration between APHL and NCEH, DLS and NCID.

RESOURCES REQUIREMENTS

The resource requirements for this IR are in the attached budget sheets.

INTERMEDIATE RESULT 4: CAPACITY OF MINISTRIES OF HEALTH TO DESIGN AND IMPLEMENT COMMUNITY BASED PREVENTION AND CONTROL OF DISEASE

STATEMENT OF THE PROBLEM

In the wake of the Hurricanes George and Mitch, outbreaks of dengue, cholera, leptospirosis and other diseases have already been reported, though information about them remains insufficient. The prevention and control of infectious diseases, already a problem in these countries was worsened by the interruption of communication and loss of infrastructure. Communities that in general lack the resources and skills to protect themselves from threats that come from within their household and community environments were much less able to cope with the enormous challenge presented to them by the hurricanes emergency.

Based on the activities of IR1, IR2 and IR3 the countries will have enhanced laboratory capacity, epidemiology, and will have selected a priority disease to target for control and prevention. Although there are multiple problems that deserve attention in each of these countries it is important that at least one health problem is selected and addressed to show the results of the activities from the other IR's particularly at the community level.

For every priority disease, there are multiple programs already in place implemented by Governments, non-governmental organizations, universities, PAHO, and the communities themselves. There are also important players in health that are not a part of the formal MOH structure that are working on health-related programs (water and sanitation, air quality, food security). Selection of the particular program will involve assessing the priorities, understanding the strategies and accounting for the existing resources.

Community-based prevention programs offer a sustainable means to protect affected populations from the infectious disease consequences of natural disasters. Community-based prevention programs that are suitable, well accepted and promote an active role of the community have proven to be more effective than those in which the community is not factored into the program planing, implementation and evaluation. Examples of community-based prevention programs are those addressing diarrheal diseases, filiarasis, malaria, intestinal helminths, and dengue. For example, private sector production and sale of safe containers and disinfectant for water; organizing home-based care for HIV or other chronic diseases; community organized environmental cleanup programs, immunization programs; school-based health outreach programs; training community members in maternal health and safe delivery; the use of insecticide impregnated bed nets and window and door screens; and production of protective equipment for persons with filiarsis, are all examples of interventions that have been tested in other Latin American and Caribbean countries and hold great promise for improving health. Such programs have proven to be effective in helping build the framework of multi-sectorial

cooperation that blends qualitative and quantitative approaches upon which other community-based prevention can later be added.

Under this IR, Ministries would involve all stakeholders, including non-governmental organizations, the private sector and the community in order to successfully select and then implement a targeted prevention and control program. Personnel from the MOH in the context of Data for Decision-making and the Field Epidemiology training program will work with the communities to establish the acceptability and accessibility to these health programs.

RESULTS FRAMEWORK

The following results are proposed to help achieve the Strategic Objective of " Re-establish and sustain the capacity for assessment of health status and the early detection and effective response to outbreaks and changes in disease patterns ".

4.1 – Capacity to determine health priorities established (see IR1)

Indicators

- MOH identifies 1-3 health problems to be addressed using improved information systems, epidemiology, and community-based approaches (e.g., TB, MCH, filiarasis, leptospirosis, dengue, malaria, diarrheal diseases, vaccine preventable diseases)

Activities (illustrative)

- Assessment tool and priority setting materials developed using local information, counterparts, and country level staff and programs.
- Criteria for disease selection established, e.g. magnitude, severity, existence of an effective prevention or control strategy, available resources, fit with existing programs.
- Workshop for decision-makers for priority setting with wide participation
- Use of public health surveillance and laboratory data in program design, implementation, and monitoring identified.
- MOH with FETP support conducts qualitative studies to evaluate community risk perceptions and perceived health needs using focus groups and ethnographic descriptions.

4.2 – capacity to analyze health problems established

Indicators

- 1-3 health problems characterized per country. This will be done in collaboration with each country's surveillance and monitoring systems as well as the FETP's (refer to IR1).
- 38 Field epidemiologists trained and able to fully conduct problem / decision analysis
- Basic training in problem analysis provided to 50-100 public health workers per year by the FETP program in each country.

Activities (illustrative)

- Existing data concerning health priorities acquired and analyzed at the local level
- Laboratory data for surveillance obtained and linked locally
- Access to literature increased through subscriptions, internet, CDC provision
- Need for additional information identified.
- FETP trainees and other in-country staff design methods for collection of information pertaining community attitudes towards interventions
- Full profile of disease problem and community-based interventions selected presented to multi-sectorial working group
- Technical assistance from NCID scientists as requested
- Working group identifies determining, contributing and root causes of identified health priorities

4.3 – Select sound, appropriate health strategies and interventions

Indicators

- 10 evidence-based public health reviews conducted by national (or local) staff to determine the most effective and cost-effective interventions for priority health problems
- 6 public health community based interventions or program strategies chosen

Activities (illustrative)

- Access to literature and published information on interventions and strategies improved. Link with Community based prevention services guidelines program. (Linked with information dissemination in IR2 and IR3).
- Workshop on methods to evaluate and select interventions held (e.g. efficacy, effectiveness, cost-effectiveness, and operational research for comparison of strategies).
- Criteria for selection chosen (effectiveness, cost-effectiveness, feasibility, acceptability).
- Technical assistance on selected diseases as requested by countries.
- Additional information, e.g. feasibility, acceptability, collected as necessary by FETP's, and communities.

4.4 - Capacity to develop effective, cost-effective, appropriate plans enhanced

Indicators

- Number of project and program plans at all levels of the health care system that are based on accurate, scientifically valid information
- Number of community-based projects that have evaluated suitability, acceptability and that have promoted an active role of the community

Activities (illustrative)

- Workshop with a wide variety of decision-makers for development of implementation plans for chosen interventions.

- Technical assistance as requested from regional, bilateral or other agencies.
- Regional workshops (PAHO, MOH, Non-governmental organizations, TEPHINET) to share lessons learned in prevention and control of diseases.
- Monitoring and evaluation frameworks for plans developed
- Promotion of community involvement in planning, design and evaluation of health interventions in collaboration with health, other Ministries, and non-governmental organizations.

4.5 Implement prevention and control programs for priority diseases.

Indicators

- Number of projects and program plans funded by MOH or other sponsors.
- Improvements in the delivery of the health program selected by the country (proximal measures of quality and efficiency such as increased number of TB cases correctly diagnosed, increased detection of maternal deaths, improved delivery of essential drugs for a specific program)
- Plan to measure health outputs linked with improvements in health program capacities. (Unlikely that within 2 years substantive changes in health outcomes will be measurable).

Activities

- Establish baseline trends and magnitude of health problem (linked with IR1)
- Establish priority questions to be answered by FETP trainees over next 3-5 years (link with IR2).
- Technical assistance in specific disease as requested from regional
- Workplan for specific steps related to the disease selected developed
- Transfer of funds to relevant institution for implementation.
- Monitoring of process and outcome indicators ongoing.
- International, regional and national scientific conferences on lessons learned in specific disease prevention and control activities. Presentation by national staff (FETP and other nationals) of results of intervention activities.

4.6 Capacity to develop strategies for community participation established

Indicators

- Methods for measuring community participation selected (developed) and taught to FETP trainees.
- Number of community-based programs are planned, implemented and evaluated with active participation of the community

Activities (illustrative)

- Methods to assess and promote community participation and self-evaluation presented to MOH
- methods to promote community participation and self-evaluation presented to FETP

- workshop with Working group including community organizations on planning, setting goals and generating resources to carry out community based prevention programs
- all program plans are reviewed to specifically address role of the community in reaching program goals
- technical assistance provided as requested

4.7 – Forum for intra and inter-sectorial cooperation established

Indicators

- number of multi-sectorial working groups formed around health problems
- number of working groups include members outside of the MOH
- One regional conference per year (organized by PAHO, TEPHINET or others).
- Working group established between sponsors to ensure coordinated inputs and plans.
- Working group for each IR established at National and regional level.

Activities (illustrative)

- Stakeholders in health problem identified with MOH
- MOH issues invitations to participate in Working Group
- Working groups established.
- Working Group meets at least every 6 months to review information, develop plans, monitor and evaluate progress

Indicators will be tracked through monthly, quarterly and annual reports. In addition, a final evaluation will be programmed for 1 year after the completion of the project providing resources are identified. A table with indicators and method of collection is included in the annex.

APPROACHES TO BE USED

Based upon the priorities set by each country, DIH will work with the MOHs to develop data-based strategies to prevent and / or control 1-3 health problems in each country. The selection of specific health problems will be made locally after review of information and a priority setting exercise with the respective Ministry of Health. Problems that have been mentioned include malaria, filiarasis, TB, leptospirosis, MCH, immunization, HIV, dengue, and diarrhea diseases including cholera. The various Centers within CDC have agreed to provide subject matter expertise as requested for the chosen priorities to guide the process (National Center for Infectious Diseases (NCID), Environmental Health, Occupational Health, HIV/STD and TB prevention). Additionally, funds will be provided to PAHO for community level interventions where they have the greater expertise and experience.

A key component of this IR is the establishment of Working Groups to address priority health problems. CDC will encourage that each priority be assigned to a Working Group chaired by of representatives of the responsible section of the MOH and including as many of the following as feasible and appropriate: other sections of the Ministry, other Ministries concerned with the

health problem, non-governmental organizations, the private sector, community organizations, the media and all others. The Working Group will receive training and technical assistance in the design and implementation of control and prevention programs (linked to IR1 and 2).

Working closely with counterparts in the control programs, as well as drawing on expertise from local non-governmental agencies and Universities, DIH will help Working Groups define the parameters that contribute to the problem. The MOH, working with FETP trainees, will be assisted in the collection of additional information including that obtained from facility surveys, community based surveys and focus groups.

Once the root causes of the health problem - including the impact of policies, legislation, health worker and community attitudes and practices - are identified, the control programs of the MOH, working with partners from other sectors and representatives of the community will be in a better position to select the best interventions and strategies available for the prevention and control of the health problem. DIH will assist in identification of strategies and development of strategic and operational plans to address the problems. Program plans will be developed to implement scientifically sound approaches; these might include changes in national level policy, facility-based services and/ or community based actions. Given the 2-year timeframe for this project, full implementation of any plan may not have been accomplished before the end of external assistance, so changes in morbidity, mortality and process indicators will be monitored by the MOH for future adjustments in the programs.

Many of the countries in the target region can be supposed to share common health and operational problems. Training workshops will be held on an inter-country basis where subject areas are overlapping. During the early phases of the project, it is expected that local expertise will be identified in one or more of the host countries. For example, there are MPH programs in Honduras and Nicaragua where expertise in project planning may be identified.

Given the proximity of the target countries and the ease of movement between them, it is sure that they share many common health problems and that transmission across countries may pose a problem. This phenomenon has been described as the "epidemiologic corridor". If this has not already been addressed by PAHO or other regional body, it is planned to hold a regional workshop in years 1 & 2 to identify and address regional strategies for prevention and control.

The FETPs that are to be established in the region serve as an important resource to this IR. The faculty of the FETP can also support workshops and trainees can be assigned the collection of information for the completion of their competencies.

COORDINATION

In part, coordination will be accomplished by the Ministries of Health and disease control programs with CDC support. The MOH will be encouraged to form Working Groups for each health priority. These WG will include members from the MOH, other Ministries (e.g. Agriculture for malnutrition), the private sector and communities.

DIH / CDC will work in close collaboration with the USAID missions. All consultants will provide briefings and debriefings as desired by the mission. Work plans will be approved by USAID Washington and local USAID missions and quarterly / annual reports will be copied to both entities.

Coordination with PAHO will be twofold. First, funds provided via a cooperative agreement will be in the context of a work plan developed by them and approved by CDC. Reporting on funds is specified within the agreeements. In addition, CDC and PAHO will coordinate in the US and within countries to ensure the best use of local resources.

Challenges to completion of these plans will include, among others, 1) the capacity of the Ministries of Health to dedicate leadership, staff and other resources needed to undertake them, 2) coordination of these efforts in a multi-country project, 3) the financial and technical capacity of the Ministries of Health to implement activities following completion of CDC's contribution 4) Political instability in governments and ministries of health, and 5) Personnel turnover within governments and key Ministries.

MANAGEMENT PLAN

The prevention and control activity will be implemented jointly with the surveillance system activity and the Field Epidemiology Training Program by the Division of International Health /EPO. The project team will include DIH/EPO, the Public Health Practice Program Office and other Centers within CDC (NCID, NCEH, NCHS, HIV/STD and TB). Staffing will be coordinated with National Immunization program (NIP) and PAHO staff for Measles elimination where possible.

TEPHINET, the consortium of FETPs based in Atlanta and Geneva, can offer coordination with Mexico and other FETPs in the region and elsewhere. Through a cooperative agreement with CDC, TEPHINET can therefore offer assistance in evaluation of surveillance systems, development and implementation of training programs, evaluation if programs and rapid response to public health emergencies. DDM and DIH would be responsible for coordination of this input with the needs of the Ministries and USAID.

RESOURCES REQUIREMENTS

The resource requirements are estimated in the attached budget. The actual budget will be greatly influenced by the choice of health problems. For example, USAID missions in countries have already indicated interest in implementing diarrheal disease control strategies using the production and marketing of water containers as the intervention. The governments of Nicaragua and Guatemala have expressed interest in leptospirosis and dengue control. The budget will be further refined after discussions with missions and Ministries of Health and the priority setting exercises.

IV. STAFFING PLAN

The following staffing plan is proposed to accomplish the SO in the timeframe allotted.

Laboratory reconstruction and training.
National Centers for Environmental Health and The Association of Public health Laboratories
Personnel funded by this project include one laboratory technician at CDC to oversee the implementation and coordination of effort. APHL will hire 2 project managers in Washington and one person to be stationed in-country. In addition, core staff of CDC and APHL will provide assistance as needed to the project.

FETP host countries (2)
Each of the 2 FETP host countries will require a (medical) epidemiologist and a public health advisor.

The epidemiologist will function as the senior consultant to the FETP and be responsible for liaison with the host Ministry of Health, coordination with the other Ministries of Health and CDC advisors, on-the-job training of the FETP Director and staff, assisting in the development and revision of curricula and training materials, identification and training of field supervisors in-country, coordination of field supervisors throughout the region. The epidemiologist will also oversee the implementation of improvements in the surveillance system, providing technical assistance to the host country Ministry of Health, identifying needs for external assistance – epidemiology or laboratory and overseeing the implementation.

Of the 2 epidemiologists based on each of the FETP countries, one will be designated the senior coordinator for the 6 country project. This person will be responsible for coordinating regional activities and act as a resource for the other assignees.

The public health advisor will oversee the management functions of the FETP and assist the epidemiologist in the implementation of technical aspects of the project. The public health advisor will also facilitate laboratory activities, especially as concerns ordering of equipment and coordination of visits as requested by NCEH/APHL. The public health advisor will be responsible for writing reports for USAID (missions and Washington) through CDC /Atlanta as well as assisting counterparts in developing a reporting system on progress made for their Ministries of Health. These reports are not only for the host countries but the others as well.

Non Host countries (3)
Each of the 3 countries that does not host an FETP will require a (medical) epidemiologist as Resident Advisor to the Ministry of Health. The RA in the Dominican Republic will also provide technical assistance and oversight to the MOH in Haiti.

The Resident Advisor will provide coordination and on-the-job training for the improvement of the surveillance system in their country, will assist the MOH in the development and planning of data-based strategies for the prevention and control of 1-3 priority health problems and will work with field supervisors to assist FETP trainees in the accomplishment of their competencies. They

will also facilitate the work on the laboratories by facilitating communications with NCEH/APHL, assisting in the identification of technical and resources needs and in ordering and receiving equipment and supplies.

CDC will make every effort to assure not only that all assignees speak fluent Spanish, but that they represent complementary areas of subject matter expertise (infectious diseases, dengue, malaria, TB, injury, chronic diseases,) of interest to their MOH, such that technical assistance can be developed and provided from within the region.

Atlanta

Atlanta will be providing the back up technical, logistic and managerial support to each of the 7 assignees. They will also be acting as liaison between the assignees and the technical support available from subject matter experts throughout the CDC CIO's. The Management Unit based at DIH/EPO will be responsible for coordinating all activities by EPO, NCEH and TEPHINet to assure accomplishment of the SO, will act as the principle liaison with USAID/Washington, will coordinate workplan, reports and financial reporting as specified in the project agreement. In addition, there are also several areas of subject matter expertise required by each country but not totaling a full FTE. As such, the staffing pattern envisaged for Atlanta is:

2 full-time medical epidemiologists providing technical oversight and liaison with subject matter expertise. Travel within the region linking FETP's, field supervision sites, and DDM projects, will represent at least 30% time.
2 full-time public health advisors providing managerial oversight, assuring reporting functions and assisting the medical epidemiologist. Travel to project sites will represent at least 30% time.
1 full-time laboratory technician at NCEH
1 full-time program specialist providing administrative support and liaison
1 full-time transportation specialist providing support for all TDYers in the region
50% communications specialist providing technical assistance and training for MOH in communications principals and development of feedback bulletins
50% training specialist providing assistance in curriculum development and materials design for FETP training, DDM training, laboratory training and all other workshops / short courses
Other expertise, such as in economics, infectious diseases specialists and management on an ad hoc basis in response to needs identified by field assignees in consultation with the MOHs

There are 3 important implementing partners in this effort – PAHO, APHL and TEPHINET.

CDC has held preliminary discussions with PAHO about the best mechanism to assure coordination between the 2 organizations. One possibility is the assignment of one of the above personnel (Atlanta-based) to the PAHO office in Washington. This will be further explored in the near future.

APHL plans to assign one person to the region and 1.5 persons to provide logistical and technical backstopping at their offices in Washington D.C. These and the activities to be implemented by APHL will be funded under this project through a Cooperative Agreement.

TEPHINET will be identifying and traveling technical resources among graduates, staff and trainees of the 5 FETP in the region and potentially worldwide. To accomplish this 2 staff, based in Atlanta, will be funded under this project through a grant or Cooperative Agreement. Most consultation will be provided by the FETPs as needs and skills are matched by TEPHINET.

V. ANNEXES

List of annexes:
Annex 1: Association of Public Health Laboratories
Annex 2: Applied (Field) Epidemiology Training: Skills and Competencies.
Annex 3: TEPHINET
Annex 4: Cooperative Agreement between PAHO and CDC
Annex 5: Results Framework
Annex 6: Budget

ANNEX 1 - ASSOCIATION OF PUBLIC HEALTH LABORATORIES

Background & History of APHL: The Association of Public Health Laboratories (APHL) is a non-profit association representing public health laboratory interests. Since 1952, APHL has supported advanced laboratory training in basic and advanced topics in its laboratories and at other sites in the U.S. and other countries. Members of the Association have considerable expertise for training in public health laboratory practice and have hosted many international students and provided or assisted in training programs in many countries.

Capacity of APHL:

The Association of Public Health Laboratories (APHL) has established mechanisms to coordinate the assessment and improvement of multiple parameters of national and international public health laboratory practice and has maintained partnerships to promote the assessment, development, and evaluation of high priority laboratory training activities. In this capacity, we are well-equipped to assist in the establishment of a potential network of public health laboratories in the Central America region.

Specifically, APHL can:

1) Advise on matters relating to public health laboratory management, organizational and personnel development, budgeting, workload measurement and cost accounting;
2) provide laboratory assessments as well as assessor training for defined areas of public health laboratory management and practice;
3) assist in developing management information systems, computerized lab based data systems, networking, information exchange and communications;
4) coordinate, and facilitate laboratory training programs in areas including, but not limited to anti-microbial susceptibility testing, and isolation and identification of various enteric diseases;
5) provide guidance in organizing meetings and conferences on laboratory science and practice related to disease control, outbreak investigation, surveillance and epidemiology; and,
6) assist in the standardization of laboratory procedures and quality assurance and quality control practices.

In the past, APHL has provided training and consultation to Central laboratories in Central and South America and the Caribbean region. Below is a brief summary of the recent projects in the Region of the Americas.

Establishment of Public Health Laboratory Partnerships

A pilot project was established to address public health laboratory activities in Latin America and the Caribbean. The goal of this pilot program was to establish linkages between three countries (Jamaica, Guatemala, and Ecuador) and three state public health laboratories (Michigan, Wisconsin, and North Carolina, respectively). The purpose of these linkages was to provide the impetus for improvement of scope and quality of public health laboratory services. Based upon the completion of these projects, it was determined that any progress was dependent upon the support of the National Ministries of Health (or its equivalent). Without that support, such projects tend to be very focused with no continuing activity to assure either improvement or expansion of services. Training for both bench laboratorians and upper level laboratorians (e.g. laboratory director) was sited as an immediate need. Since the middle and senior level laboratory administrators are fundamental in maintaining the infrastructure of the public health laboratory system, training in quality assurance, personnel standards, continuing education, leadership skills, etc. were required. In addition to laboratory training, the integration of laboratory activities with program activities is essential to assure appropriate control, quality, and success of public health systems.

Caribbean Epidemiological Center (CAREC) Distance Learning Project

The purpose of this project was to work with the Division of Laboratory Systems at CDC to assist in the development and delivery of distance learning programs for public health laboratorians in the Caribbean region. The countries selected for the pilot program were Jamaica, Belize, Cayman, Bahamas, Barbados, St. Lucia, St. Vincent, Suriname, Trinidad & Tobago. The three main components of this project were to 1) assess the feasibility of using live, interactive satellite videoconferencing as part of CAREC's training program; 2) Compare various distance learning instructional strategies in terms of their feasibility and impact on reach and knowledge gained, and; 3) determine what will be required to make a distance learning a sustainable component to CAREC's program.

Annex 2: Applied (Field) Epidemiology Training: Skills and Competencies.

- Measure indicators of health status and magnitude of disease problems in the population
  - Conduct outbreak investigations
  - Organize, run, and evaluate surveillance systems
  - Identify risk factors and populations at risk for common diseases and conditions
  - Identify, respond to, and find solutions for emerging, heretofore unrecognized threats to the public's health
  - Assist Ministries of Health to rationally set priorities among common health problems

- Assist Ministries of Health in the design of effective health interventions based on epidemiologic evidence and literature based reviews

- Work with local communities to develop mechanisms to detect diseases and serious health problems

- Communicate with community members, leadership and groups to implement health policies and programs

- Evaluate the effectiveness of health service delivery and utilization of health resources

- Evaluate the effectiveness and the impact of health-promoting and disease-preventing interventions

- Communicate properly analyzed and interpreted health information in a timely manner to policy-makers and planners.

At the end of the training each Public Health Practioner or Intevention Epidemiologist (Field Epidemiologist) will have completed the following:

1. Use surveillance, other health information systems, or professional contacts to identify public health problems requiring epidemiologic investigation.

2. Conduct or participate substantively in a field investigation of a potentially serious public health problem that requires a rapid public health response. This health problem can be infectious or non-infectious in nature and should involve direct contact with human subjects.

3. Write a research protocol and develop supporting human subjects documents.

4. Design, conduct, and interpret an epidemiologic analysis of a new or pre-existing data set. This data set must have been collected by the trainee or obtained from existing or

routinely collected data by the FETP or other public health institution in the country. As a result of the analysis, appropriate public health recommendations should be made.

5. Design, implement, or evaluate a public health surveillance or other information system.

6. Develop and carry out a pre-planned epidemiologic study or survey to assess a health concern of public health importance to the country (gap analysis). The nature of this problem may be either infectious or non-infectious.

7. Use scientific literature to support the findings of epidemiologic investigation and recommendations made from investigations. An evaluation of an existing or planned public health strategy will be undertaken. The results of this investigation will be provided as a written document and oral presentation in GHL ongoing seminars during the training program.

8. Write and submit a report for publication in an epidemiology or public health bulletin and write a scientific manuscript for a peer-reviewed journal.

9. Give an oral presentation at a national or international scientific conference.

10. Respond appropriately to written or oral public health inquiries from the public, the media, government officials, or other health professionals.

11. Teach in a course on public health topics and/or serve as a proctor or mentor for junior level trainees.

12. Write a fundraising document for a proposed program to implement activities that will improve public health outcomes.

13. Communicate with the media and representatives of a community on a health problem or program.

14. Present briefing document to decision-maker (WHO leadership, National MOH or Politicians) on az health problem.

15. Use computers effectively to manage public health work including: budgeting (spreadsheets), epidemiologic analysis (Epi-info), document presentation (wordprocessing), and communication (graphics).

16. Attend and participate in training courses on program evaluation, cost-effectiveness analysis, graphics and visual presentations and media relations

Optional Activities: Trainees are encouraged to participate in program management activities and actual implementation of public health interventions.

ANNEX 3- Training Programs in Epidemiology and Public Health Interventions Network

Background and History of TEPHINET: The Network of Training Programs in applied Epidemiology and Public Health Interventions (TEPHINET) is an international non-profit organizations aiming to improve global health through high quality community-oriented competency-based training for public health practitioners. Since 1951,"learning by doing" became the standard of effective training field epidemiologists; over the years the method became adapted to other countries, now 25. Since 1997, these national programs decided to formalize networking to share expertise, training materials, help countries with needs, and provide response teams to provide technical assistance to study outbreaks and provide relief and assessment during disasters. In the aftermath of Hurricane Mitch, graduates/trainees of Peru, Mexico, USA, and Colombia were sent out to assist communities affected. This year, under the auspices of PAHO, graduates/trainees of Peru, Mexico and the USA assisted the MoH of El Salvador to contain a cholera outbreak. For 4 months now a graduate of the Peruvian FETP has provided on-site consultation on behalf of PAHO to help establish an FETP-like training program in the region.

Capacity of TEPHINET: TEPHINET has the support of 24 national training programs around the world, and their host institutions. These institutions include the Colombian, Mexican, and Peruvian MoH, and their laboratories: National Institutes of Health of Colombia and Peru, and the National Diagnosis Reference Institute of Mexico. In addition, there is networking with CDC, LCDC, and Carlos III FETPs and laboratories.

Specifically, TEPHINET can:

1) Provide training to trainers, through the following mechanism:
   a) Receiving trainees/trainers to participate in investigations, observe how the apprenticeship is carried out,
   b) Through Train the Trainer regional workshops, and
   c) Exchange of training materials.
2) Assist to develop culturally appropriate teaching materials,
3) Assist to organize Regional Scientific Conferences, and
4) Assist in the establishment of national programs in Central America, by providing short-term and long-term consultants.

ANNEX 4: Draft Agreement between CDC and PAHO

George Alleyne, M.D.
Director
Pan American Health Organization
525 23rd Street, NW
Washington, D.C. 20037

Re: Collaboration with PAHO

Dear Dr. Alleyne:

In response to the destruction from Hurricanes Georges and Mitch in Central America, funding has become available to the Centers for Disease Control and Prevention (CDC) to assist with reconstruction related to certain public health activities. The Pan American Health Organization (PAHO) and the CDC have a long history of cooperation in this area. We would like to provide, through a cooperative agreement mechanism, a total of $2 million to support PAHO in joint activities for the reconstruction in selected countries. Enclosed is a proposed budget for these funds.

The CDC will provide technical support to each country to review available information and develop their own priorities for rebuilding and strengthening their health systems. Based on this priority setting process, we will work with the countries to design and implement projects to provide the capacity to meet needs identified by the countries for their information systems and disease prevention and control partners. This is an exciting model, which will strengthen our partners= abilities to make evidence-based decision making in addition to helping them build capacity to design and implement better information systems and intervention programs. By involving our partners in the design of activities, we believe the countries will feel more ownership and that the project will be more sustainable.

Because of PAHO=s longstanding relationships with Ministries of Health in the sub-region and the history of successful collaborations between PAHO and CDC, PAHO is the ideal partner to help CDC coordinate and facilitate this large project. We would like to propose the following roles for PAHO:

- Coordination of **sub-regional organizational planning** including sub-regional analysis and dissemination of health information, sponsorship of sub-regional meetings for definition of inter-country prevention and control strategies.
- Sub-regional **networking of laboratory support services**. This includes coordinating the planning for a regional laboratory network and involves the development of reference centers and providing quality assurance and quality control training and manuals for involved countries.
- Sub-regional goal of **disease prevention and control strategies** in collaboration with CDC. This includes providing assistance to Ministries of Health for developing programs to prevent and control priority infectious diseases. Examples of activities put forward include urban malaria control, monitoring drug resistance, and the promotion
of community based prevention strategies. Community participation and social mobilization for dengue control and/or water and sanitation are also of interest.

The CDC strategy as defined in the overall document for Hurricane Mitch reconstruction involves (1) epidemiology training and (2) prioritizing key gaps in health information systems while selecting disease control programs to target at a National level. Assistance to Ministries of Health in the design and implementation of disease control and prevention programs can best be accomplished through the strengths of both agencies contributing to local efforts. We expect that CDC and PAHO will both collaborate actively with the Training in Epidemiology and Public Health Interventions Network (TEPHINET), which will be another source of experts in epidemiology training.

The CDC proposes to establish the Cooperative Agreement with PAHO for implementation of Post-Hurricane activities in the amount $1 million per year over the 2-year project for a total of $2 million (contingent upon full funding of the subject program by USAID). Submission of a PAHO work plan will assist in coordination of activities and allow CDC to submit the required reports to USAID on the use of funds provided by the United States. PAHO should take the opportunity to review and revise the activity areas listed above based on their own needs and assessments.

Mechanisms

The CDC requests that PAHO submit a work plan describing implementation strategies. The cooperative agreement would be awarded either as a supplement to an existing Agreement or as a new Agreement. Under the terms of the agreement, PAHO/Washington will be asked to submit reports twice yearly. Progress towards achievement of goals and program objectives will be reviewed biannually by a Coordination Committee composed of USAID, CDC and PAHO representatives.

Communications

Communication and reporting on the overall program will be between PAHO/Washington and CDC/Atlanta. In the sub-region, CDC representatives in the field will communicate directly with their counterparts for the sub-region and the individual countries. Representation of the overall project to the Ministry of Health will be the responsibility of in-country CDC staff, and a spirit of collegiality and professionalism is expected from all parties.

We look forward to working closely with PAHO and the impacted countries on this vital reconstruction project which will assist these nations in rebuilding from the destruction of these storms.

Sincerely yours,

Jeffrey P. Koplan, M.D., M.P.H.
Director

Enclosure

Enclosure

Budget Revision: Hurricane Mitch Reconstruction

	Year 1	Year 2	Year 3	Total
IR1 =	1,272,000	3,698,000	0	4,970.000
IR2 =	1,201,620	443,644	0	1,645,264
IR3 =	508,524	353,940	202,940	1,065,404
IR4 =	472,750	257,000	0	729,750
Staff =	1,662,501	1,694,779	1,232,302	4,589,582
PAHO =	1,000,000	1,000,000		2,000,000

Total
15,000,.000

All monies in US Dollars.

Annex 5 – Results Framework

Annex 6 - Illustrative Budget

The following budget is illustrative and will be modified once country workplans have been developed. It is expected that the totals will change between line items, IR's and countries as real needs are identified and plans developed. An interim budget for the initial phases of the project ("initial visits" and assessments) is included. CDC anticipates that workplans and detailed budgets will be developed within 120 days of the receipt of the InterAgency Agreement.